SLOVENSKI STANDARD
SIST EN 12173:2013

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Nadomešča:
SIST EN 12173:2005

Kemikalije, ki se uporabljajo za pripravo pitne vode - Natrijev fluorid

Chemicals used for treatment of water intended for human consumption - Sodium fluoride

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumfluorid

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Fluorure de sodium

Ta slovenski standard je istoveten z: EN 12173:2012

ICS:

13.060.20	Pitna voda	Drinking water
71.100.80	Kemikalije za čiščenje vode	Chemicals for purification of water

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EUROPEAN STANDARD

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English Version

Chemicals used for treatment of water intended for human consumption - Sodium fluoride

Produits chimiques utilisés pour le traitement de l'eau destinée à la consommation humaine - Fluorure de sodium

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Natriumfluorid

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 12173:2012) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12173:2005.

The significant technical differences between this edition and EN 12173:2005 are as follows:

— Modification of 6.2 on labelling, deletion of the reference to EU Directive 80/778/EEC of 15 July 1980 in order to take account of the latest Directive in force.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

In respect of potential adverse effects on the quality of water intended for human consumption caused by the product covered by this European Standard:

a) this European Standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;

b) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

NOTE Conformity with this European Standard does not confer or imply acceptance or approval of the product in any of the Member States of the EU or EFTA. The use of the product covered by this European Standard is subject to regulation or control by National Authorities.

1 Scope

This European Standard is applicable to sodium fluoride used for treatment of water intended for human consumption. It describes the characteristics of sodium fluoride and specifies the requirements and the corresponding test methods for sodium fluoride. It gives information on its use in water treatment. It also determines the rules relating to safe handling and use (see Annex B).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods* (ISO 3696)

ISO 2831, *Sodium fluoride for industrial use — Determination of water-insoluble matter*

ISO 2832, *Sodium fluoride for industrial use — Determination of moisture content*

ISO 2833, *Sodium fluoride for industrial use — Determination of fluorine content — Modified Willard-Winter-method*

ISO 3165, *Sampling of chemical products for industrial use — Safety in sampling*

ISO 5993, *Sodium hydroxide for industrial use — Determination of mercury content — Flameless atomic absorption spectrometric method*

ISO 6206, *Chemical products for industrial use — Sampling — Vocabulary*

ISO 6353-1, *Reagents for chemical analysis — Part 1: General test methods*

ISO 8213, *Chemical products for industrial use — Sampling techniques — Solid chemical products in the form of particles varying from powders to coarse lumps*

3 Description

3.1 Identification

3.1.1 Chemical name

Sodium fluoride.

3.1.2 Synonym or commons name

Sodium fluoride.

3.1.3 Relative molecular mass

42.

3.1.4 Empirical formula

NaF.

3.1.5 Chemical formula

NaF.

3.1.6 CAS-Registry Number [1)]

7681-49-4.

3.1.7 EINECS reference [2)]

231-667-8.

3.2 Commercial form

The product is a solid (crystals or powder).

3.3 Physical properties

3.3.1 Appearance and odour

The product is a colourless fine crystalline odourless powder or crystals.

3.3.2 Density

The density of the crystals is 2,8 g/cm^3 at 20 °C.

The bulk density of the product is 0,6 g/cm^3 to 1,4 g/cm^3 at 20 °C.

3.3.3 Solubility (in water)

The solubility of the product in water is 40 g/l at 20°C.

3.3.4 Vapour pressure

Not applicable.

3.3.5 Boiling point at 100 kPa [3)]

The product boils at approximately 1 700 °C.

3.3.6 Crystallisation point

The product melts at approximately 988 °C.

3.3.7 Specific heat

Not known.

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1) Chemical Abstracts Service Registry Number.

2) European Inventory of Existing Commercial Chemical Substances.

3) 100 kPa = 1 bar.

3.3.8 Viscosity dynamic

Not applicable.

3.3.9 Critical temperature

Not applicable.

3.3.10 Critical pressure

Not applicable.

3.3.11 Physical hardness

Not applicable.

3.4 Chemical properties

Sodium fluoride releases hydrogen fluoride when in contact with acids.

4 Purity criteria

4.1 General

This European Standard specifies the minimum purity requirements for sodium fluoride used for the treatment of water intended for human consumption. Limits are given for impurities commonly present in the product. Depending on the raw material and the manufacturing process other impurities may be present and, if so, this shall be notified to the user and when necessary to relevant authorities.

Users of this product should check the national regulations in order to clarify whether it is of appropriate purity for treatment of water intended for human consumption, taking into account raw water quality, required dosage, contents of other impurities and additives used in the products not stated in this product standard.

Limits have been given for impurities and chemical parameters where these are likely to be present in significant quantities from the current production process and raw materials. If the production process or raw materials leads to significant quantities of impurities, by-products or additives being present, this shall be notified to the user.

4.2 Composition of commercial product

The content of sodium fluoride shall not be less than a mass fraction of 98 % (NaF).

The concentration of sodium fluoride shall be within ± 5 % of the manufacturer's declared value.

4.3 Impurities and main by-products

The product shall conform to the requirements specified in Table 1.

Table 1 — Impurities

Impurity		**Limit** in mass fraction in % of commercial product
Water-insoluble matter	max	0,5
Moisture	max	0,5

4.4 Chemical parameters

The product shall conform to the requirements specified in Table 2.

Table 2 — Chemical parameters

Parameter		Limit mg/kg of commercial product
Antimony (Sb)	max	1
Arsenic (As)	max	5
Cadmium (Cd)	max	0,1
Chromium (Cr)	max	4
Lead (Pb)	max	4
Mercury (Hg)	max	0,1
Nickel (Ni)	max	4
Selenium (Se)	max	1
NOTE Other chemical parameters and indicator parameters are not relevant in sodium fluoride because the raw materials used in the manufacturing process are free of them. For parametric values of sodium fluoride on trace metal content in drinking water, see [1].		

5 Test methods

5.1 Sampling

Observe the general recommendations of ISO 3165 and take account of ISO 6206.

Prepare the laboratory sample(s) required by the relevant procedure described in ISO 8213.

5.2 Analyses

5.2.1 General

All reagents shall be of a recognised analytical grade and the water used shall conform to the grade 3 specified in EN ISO 3696.

5.2.2 Main product

The mass fraction of fluorine (C_1) in % shall be determined in accordance with ISO 2833. The sodium fluoride content, C_2, expressed as mass fraction in % is given by the following formula:

$$C_2 = C_1 \times 2{,}2101 \quad (1)$$

5.2.3 Impurities

5.2.3.1 Water-insoluble matter

The content of insoluble matter shall be determined in accordance with ISO 2831.

5.2.3.2 Moisture

The content of moisture shall be determined in accordance with ISO 2832.

5.2.4 Chemical parameters

5.2.4.1 General

The content of chemical parameters shall be determined using the procedures specified in Table 3.

Table 3 — Procedures for the determination of chemical parameters

Element	Reference	Method	Wavelength nm	Flame
As	see 5.2.4.3	Hydride AAS	193,7	n.a.
Sb	see 5.2.4.3	Hydride AAS	217,6	n.a.
Cd	ISO 6353-1 GM 29 See 5.2.4.2	AAS	228,8	air-acetylene
Cr	ISO 6353-1 GM 29 See 5.2.4.2	AAS	357,8	air-acetylene
Pb	ISO 6353-1 GM 29 See 5.2.4.2	AAS	217,0 or 283,3	air-acetylene
Ni	ISO 6353-1 GM 29 See 5.2.4.2	AAS	232,0	oxidising air-acetylene
Se	see 5.2.4.3	Hydride AAS	196,0	n.a.
Hg	in accordance with ISO 5993	flameless AAS	253,6	n.a.
AAS = Atomic absorption spectrometry n.a. = not applicable.				

5.2.4.2 Determination of cadmium (Cd), chromium (Cr), lead (Pb) and nickel (Ni)

5.2.4.2.1 General

The content of Cd, Cr, Pb and Ni shall be determined taking into account ISO 6353-1, modified as described in 5.2.4.2.2.

5.2.4.2.2 Procedure

The elements Cd, Cr, Pb and Ni shall be determined using the standard addition method. The reference solutions shall be made by spiking the sample with standard solutions, which contain stepwise increasing contents of the elements to be determined. The amount of internal standard to be added can be estimated from a preliminary investigation, determining roughly the element content of the test sample from simple calibration. The steps in which internal standards are added shall be at least as high as the estimated content of the test sample.

Carry out a blank determination by repeating the procedure using the same quantities of all reagents but omitting the test sample.